GOES-R Proving Ground Program Roundup

Steve Goodman
GOES-R Series
Program Chief Scientist

5th NOAA Testbed & Proving Ground Workshop
NOAA Center for Weather and Climate Prediction
College Park, MD
April 16-18, 2014

Continuity of GOES Operational Satellite Program

Fiscal Year

As of March 2014

09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36

GOES-13 GOES East

GOES-14 On-orbit spare

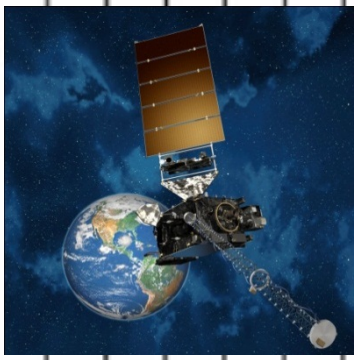
GOES-15 GOES West

GOES-R

GOES-S

GOES-T

GOES-U



Approved: Mary E. Kicza

Assistant Administrator for Satellite and Information Services

GOES: Geostationary Operational Environmental Satellite

- On-orbit storage
- Operational
- Operational beyond design life

GOES- R Flight Segment Progress

GOES-R Propulsion Module delivered to Littleton in March

SUVI FM1 delivered and installed on the spacecraft Sun Pointing Platform

ABI FM1 delivered

EXIS FM1 delivered

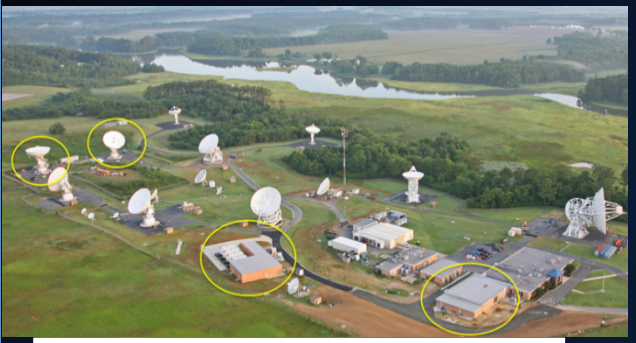
Magnetometer boom complete. On track for April completion.

GLM TVAC testing complete

SEISS FM1 delivered

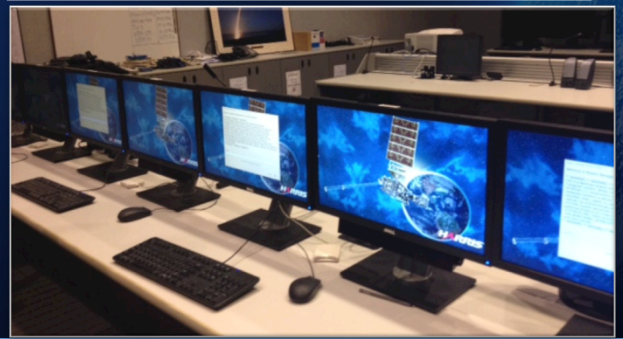
GOES-R Ground Segment Progress

Facility & Antenna upgrades at WCDAS



Antenna Feed Installation at WCDAS

RMMU installation at NSOF

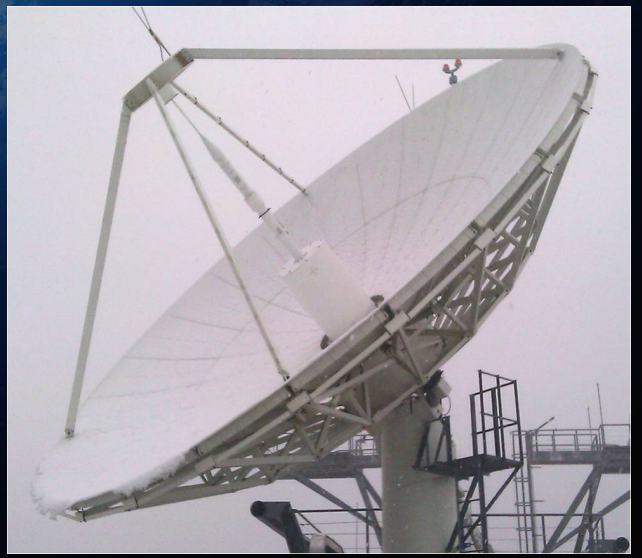


Completed tier 1, system-level Radio Frequency Compatibility Testing

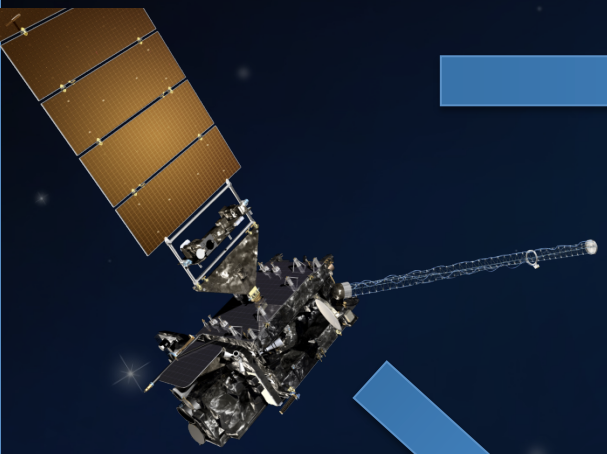
RBU Site 1 Feed installation

Enterprise Infrastructure PSR complete. Equipment delivered to WCDAS in January

NSOF N-1 Antenna upgrade



GOES-R Data Distribution



GRB

Direct Broadcast Community

Sectorized Cloud and Moisture Imagery

AWIPS NCFs

NOAA Port

NOAAPort Community

GRB

L1B and L2+ Derived Products

Instrument Data

GRB

Sectorized Cloud and Moisture Imagery

GOES-R GS

PDA

NSOF

NATIONAL WEATHER SERVICE

Operational User Community (NOAA Centers, DOD, NCEP, Int'l Partners)

L1B, L2+

WCDAS

GOES-R GS

RBU

CLASS

Climate Research & Academia

L1B and L2+ Derived Products

Fastest

Access Speed

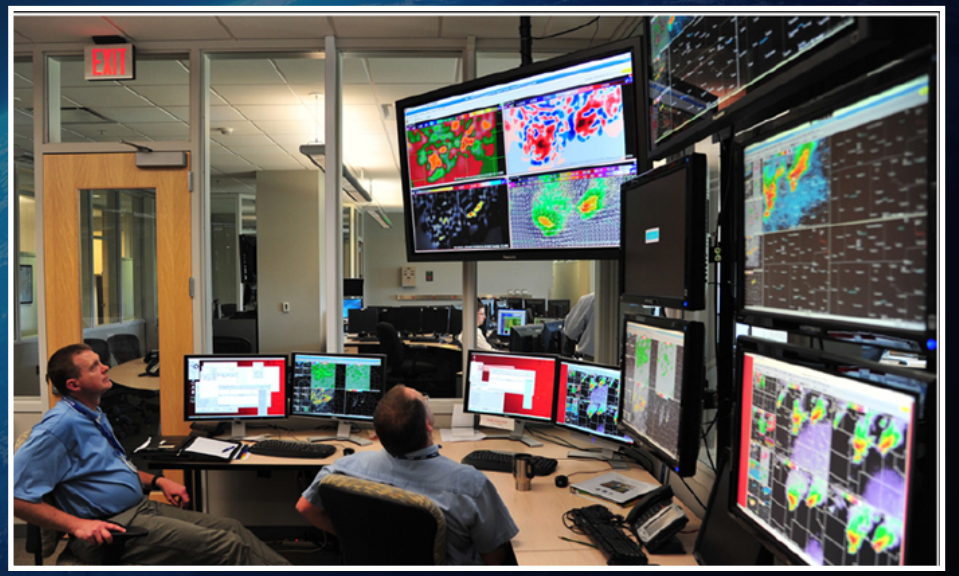
Slowest

Satellite Proving Grounds

Making GOES-R test products available to forecasters, GOES-R level 2 products for research

- Satellite liaisons (subject matter experts) at NWS National Centers
- Develop training for users
- Several GOES-R level 2 products are demonstrated in the GOES-R Proving Ground.
- Examples can be found on the PG blogs and through the website www.goes-r.gov.
- International projects
- Visiting Scientist Program

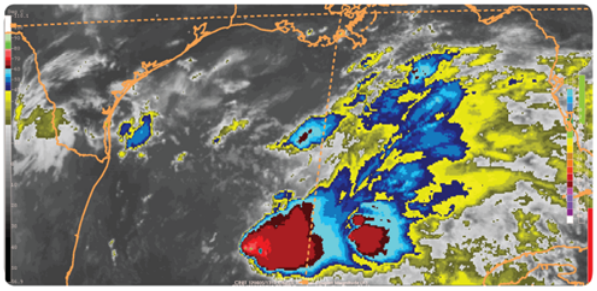
NOAA Hazardous Weather Testbed (HWT)



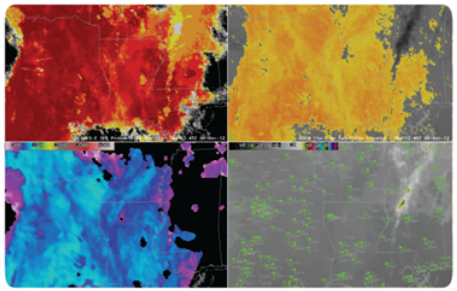
CHUVA PROJECT

2014 ESSL Testbed

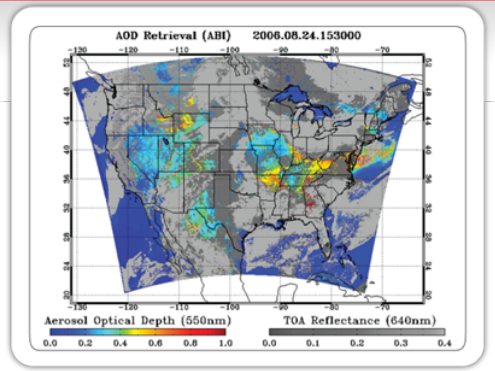
The GOES-R Proving Ground



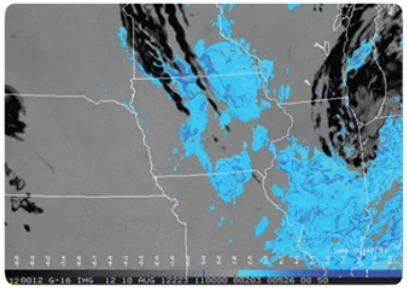
Aviation Weather Center (AWC) – Kansas City, MO
IR Imagery of Oceanic Storms



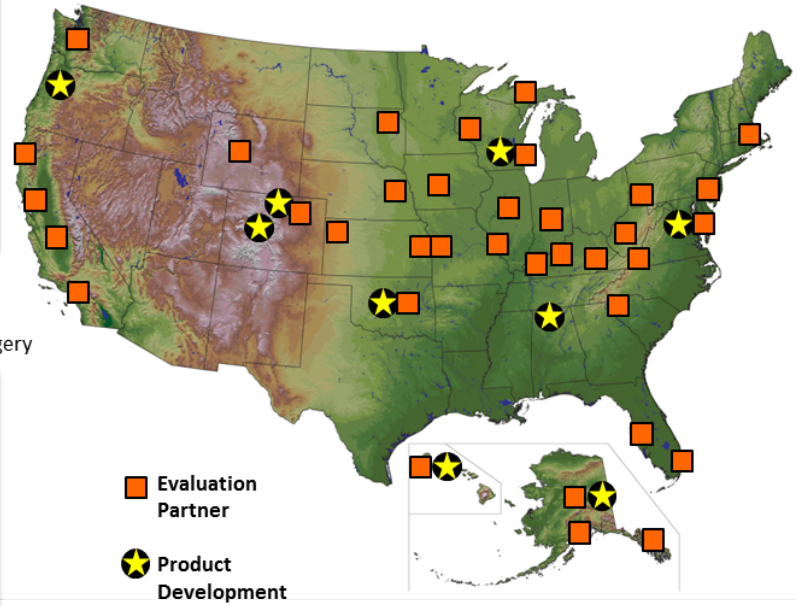
Cooperative Institute for Meteorological Satellite Studies (CIMSS)/Center for Satellite Applications and Research (STAR) – Madison, WI
Fog/Low Stratus Product



STAR/University of Maryland Baltimore County (UMBC)– College Park, MD
Aerosol Optical Depth

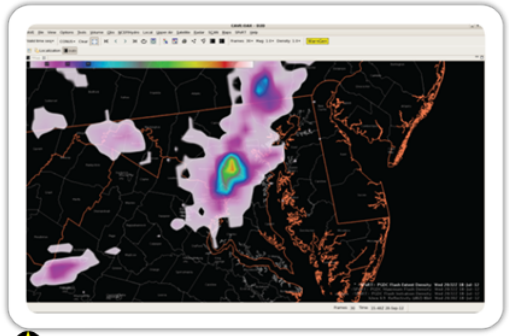


Cooperative Institute for Research in the Atmosphere (CIRA)/STAR – Ft. Collins, CO
ABI Synthetic Low Cloud Enhancement Imagery

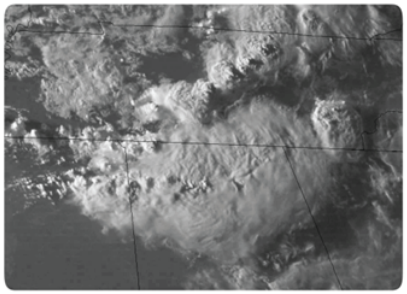


Evaluation Partner

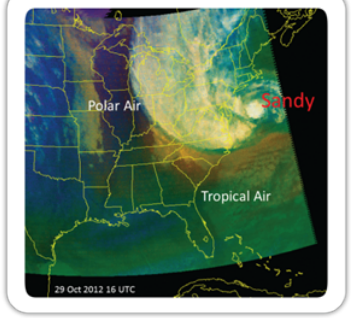
Product Development Partner



Short-term Prediction Research and Transition Center (SPoRT)/NASA – Huntsville, AL
GLM Lightning Density



Storm Prediction Center (SPC) – Norman, OK
Severe Storms 1-Min Visible Imagery of Overshooting Tops



National Hurricane Center (NHC) – Miami, FL
RGB Air Mass for Hurricane Sandy

GOES-R Proving Ground

THE GOES-R PROVING GROUND

Accelerating User Readiness for the Next-Generation Geostationary Environmental Satellite System

BY STEVEN J. GOODMAN, JAMES GURKA, MARK DEMARIA, TIMOTHY J. SCHMIT, ANTHONY MOSTEK, GARY JEDLOVEC, CHRIS SIEWERT, WAYNE FELTZ, JORDAN GERTH, RENATE BRUMMER, STEVEN MILLER, BONNIE REED, AND RICHARD R. REYNOLDS

By demonstrating the advanced capabilities of the next generation of geostationary satellites, the proving ground addresses user readiness and the research-to-operations-to-research loop.

The Geostat
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with NASA re
(spacecraft and
for the overall
GOES-R PG is
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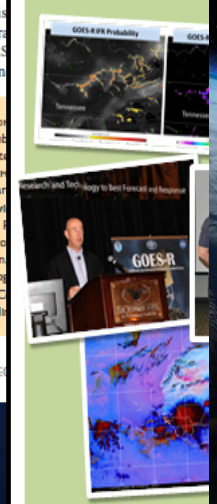
Institutes; NAS
and Transition

AFFILIATIONS: Goodm
Program Office, Greenb
NESDIS/Center for Sate
Collins, Colorado; Schm
Applications and Resear
National Weather Servi
Short-Term Prediction R
Alabama; Siewert—Coo
logical Studies, Norman
Institute for Meteorolog
Brummer and Miller—C
Atmosphere, Fort Collin

AMERICAN METE

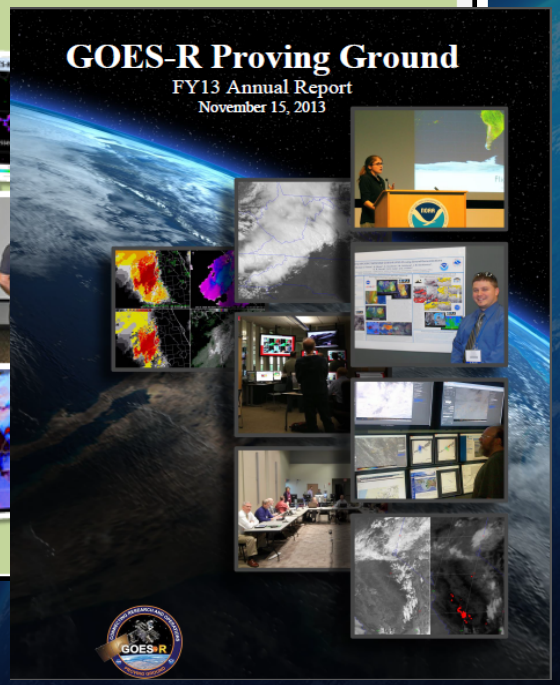
GOES-R Proving Ground

FY12 Annual Report
November 28, 2012
Revised January 22, 2013



GOES-R Proving Ground

FY13 Annual Report
November 15, 2013



U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Environmental Satellite, Data, and Information Service

NOAA Satellite Conference 2013 Summary Report

April 8-12, 20
College Park,
Final Report

THE EMERGENCE OF WEATHER-RELATED TEST BEDS LINKING RESEARCH AND FORECASTING OPERATIONS

BY F. MARTIN RALPH, PAULA DAVIDSON, BR
JIN HUANG, GARY
LARS PETER RIISHOJ

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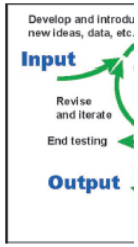


AMERICAN METEOROLO

Journal of
Applied Remote Sensing

Geostationary Operational Environmental Satellite (GOES)-14 super rapid scan operations to prepare for GOES-R

Timothy J. Schmit
Steven J. Goodman
Daniel T. Lindsey
Robert M. Rabin
Kristopher M. Bedka
Mathew M. Gunshor
John L. Cintineo
Christopher S. Velden
A. Scott Bachmeier
Scott S. Lindstrom
Christopher C. Schmidt

SPIE

2012- 2013 Proving Ground Demonstrations

- Hazardous Weather Testbed (HWT) Spring Experiment (7 May 2013 – 24 May 2013). Participants included 18 NWS forecasters and 9 visiting scientists.

- National Hurricane Center (NHC) Tropical Cyclone Demonstration (1 August 2012 – 30 November 2012). Participants included forecasters from NHC and scientists from NESDIS STAR, CIRA, CIMSS, and SPoRT.

- Aviation Weather Center (AWC) Winter Experiment (11 February 2013 - 22 February 2013) and Summer Experiment (12 August 2013 – 23 August 2013). Participants included AWC and Weather Forecast Office (WFO) forecasters, external visitors from: the Federal Aviation Administration, Lockheed Martin, the National Transportation Safety Board, NCAR, NASA Langley Research Center, United Parcel Service, and research scientists from the Air Force Weather Agency, the GOES-R program, Earth Networks, NOAA laboratories, and a number of universities.

- Weather Prediction Center/Ocean Prediction Center/Satellite Analysis Branch (WPC/ OPC/ SAB) demonstrations (1 January 2012 – 30 April 2012, focus on precipitation and ocean applications). Participants include forecasters at WPC, OPC, and SAB.

- High Latitude and Arctic Testbed (focus on snow/ fog and low stratus/ volcanic ash/ and aviation applications). Participants include NWS Alaska Region, Alaska Pacific River Forecast Center, CIMSS, SPoRT, and UAF.

2012- 2013 Proving Ground Demonstrations

- Air Quality (focus on aerosol product development and applications). Activities led by scientists from UMBC and NESDIS STAR; participants include Pennsylvania State University Meteorology Departments as well as federal, state, and local air quality forecasters, modelers, and analysts.

- Pacific Region OCONUS Demonstration (focus on tropical cyclones/ heavy rainfall/ and aviation applications) Participants include NWS forecasters and scientists from the University of Hawaii.

- NWS Central Region Fog and Low Stratus Evaluation (1 August 2012 – 31 December 2012). Participants included NWS forecasters at Des Moines, IA; Pleasant Hill, MO; Indianapolis, IN; Jackson, KY; Louisville, KY; St. Louis, MO; Marquette, MI; Riverton, WY.

- Alaska and Puerto Rico GOES-R QPE Assessment (15 July 2013 – 15 September 2013). Participants included NWS forecasters at Juneau, AK; Anchorage, AK; Fairbanks, AK; San Juan, Puerto Rico; Alaska Pacific River Forecast Center.

- European Severe Storms Laboratory Testbed - Severe weather forecasting/nowcasting across Europe (July 1-26, 2013). GOES-R Algorithm Working Group Scientist participation among the more than 140 scientists from 27 countries.

Significant Outcomes and Results

- The Fog and Low Stratus products are currently scheduled to be operationalized on OSPO ESPC systems and will be delivered to NWS users via the Satellite Broadcast Network (SBN), NCEP Central Operations (NCO) backbone, Direct Broadcast, and possibly AWIPS Data Distribution Service (DDS) as an alternative. As part of the Fog and Low Stratus suite, the Cloud Top Phase is available in AWC (experimental) operations.

- Routine use of RGB products in OPC, WPC, SAB operations (experimental).

- The RGB Dust product is now used routinely by TAFB (Tropical Analysis Forcaste branch) forecasters as input to their Tropical Weather Discussion product. It was especially useful for helping to diagnose the atmospheric stability in the early stage of Tropical Storm Florence. TAFB is considering developing a new graphical public product to depict areas of dust.

- Simulated Satellite Forecasts as of July 2013 are available in AWC operations (experimental).

Significant Outcomes and Results

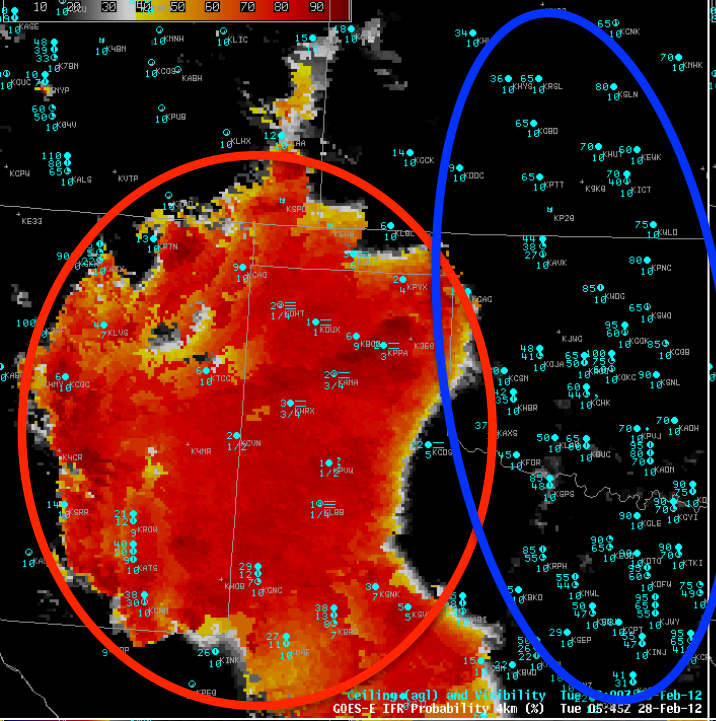
- GOES-R Convective Initiation (CI) will be transitioned into AWC operations (experimental).

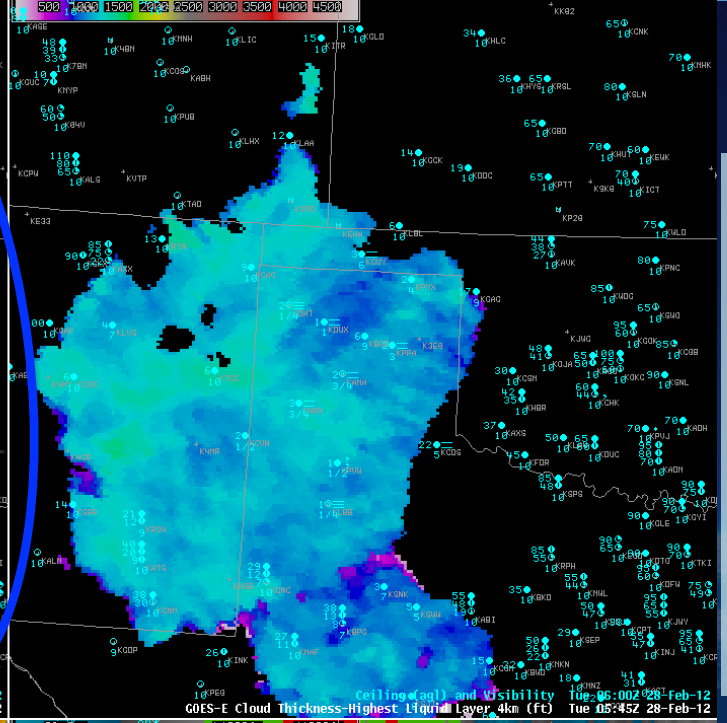
- The Cloud Top Cooling (CTC) product was transitioned into AWC operations (experimental) in the fall of 2012 and the use of the product has continued to gradually increase within the past year.

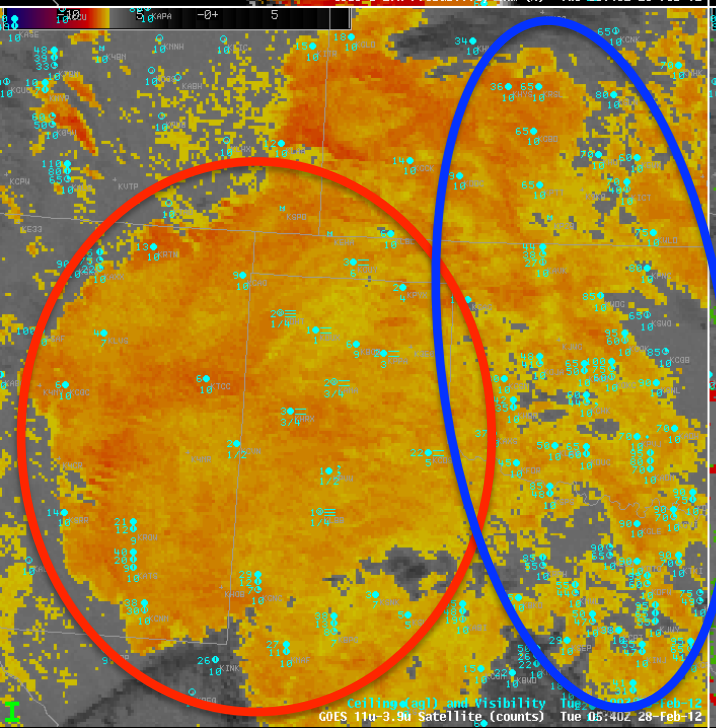
- The Pseudo Geostationary Lightning Mapper (PGLM) transition into AWC operations (experimental) is expected by the end of September 2013.

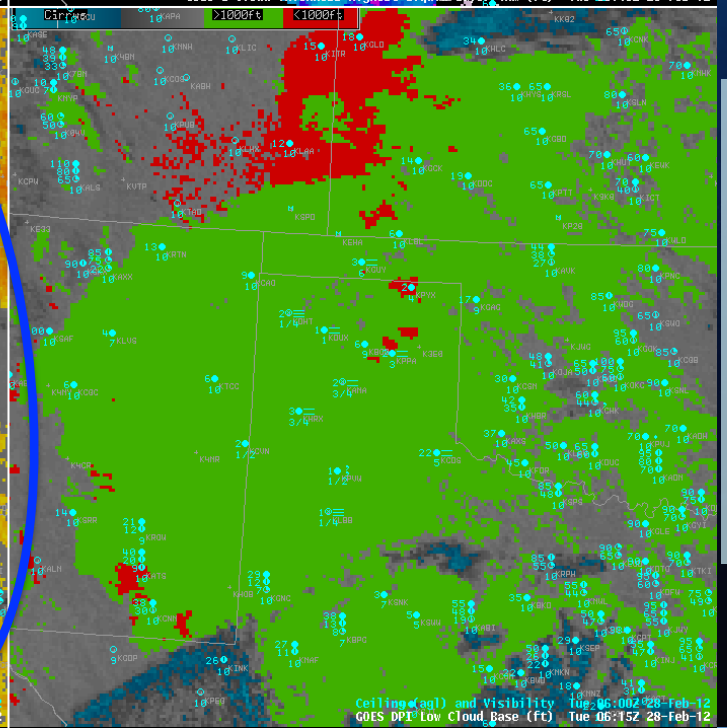
- The SRSOR (Super Rapid Scan Operations for GOES-R) 1-minute imagery, from the spare satellite GOES-14, was reactivated for the latter part of the month of August, allowing for forecaster evaluation during the AWC Summer Demonstration (2013) and the NHC Demonstration (2012). This imagery was meant to emulate the expected temporal resolution of GOES-R and was popular among forecasters, particularly for the excellent situational awareness it provides via the additional detail in areas of rapid convective development.

Additional product assessments in the individual Proving Ground and Testbed reports at http://www.goes-r.gov/users/pg-activities-01.htm







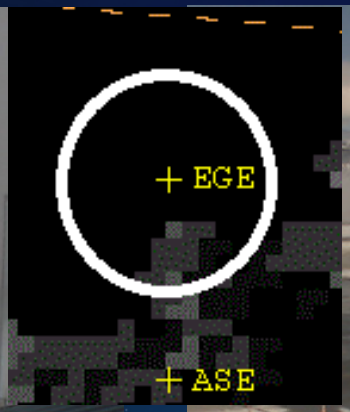


The majority of the surface stations located where the GOES-R IFR probabilities were elevated (red circle) reported ceilings and/or visibilities the met IFR criteria

None of the surface stations east or northeast of the elevated GOES-R IFR probabilities (blue circle) reported IFR conditions

2/28/2012
05:45 UTC

Eagle, CO Fog Event – 12/29/13



GOES-R IFR/LIFR fused product inputs:

1. Four IR bands and cloud phase
2. RAP/GFS temp and RH data
3. Surface type/emissivity

Ground Stop Arrivals Eagle, CO (EGE) due to LIFR FOG/CIGS

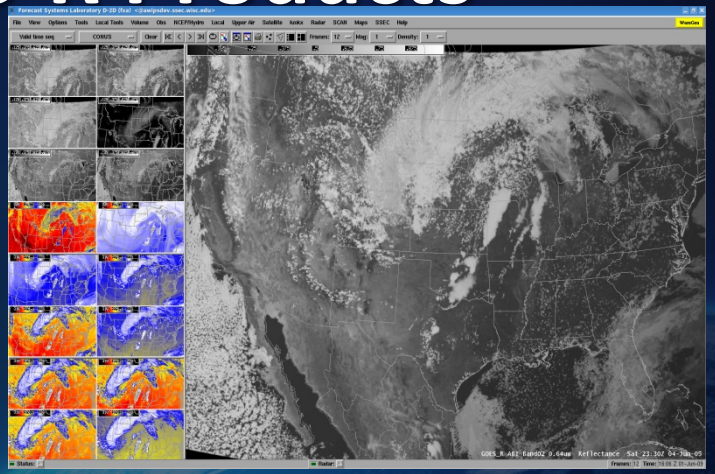
KEGE 291750Z 00000KT 1/4SM FZFG OVC002 M04/M05 A3025

1)ATCSCC/NWS Met monitored GOES-R Satellite probability of LIFR conditions
2)1830Z – GOES-R lost the one pixel of 70% probability IFR conditions
3)Met notified Terminal Specialist/Supervisor that clearing was imminent
4)Ground Stop canceled ahead of schedule
5)Customers saved time/$$ due to shortened Ground Stop

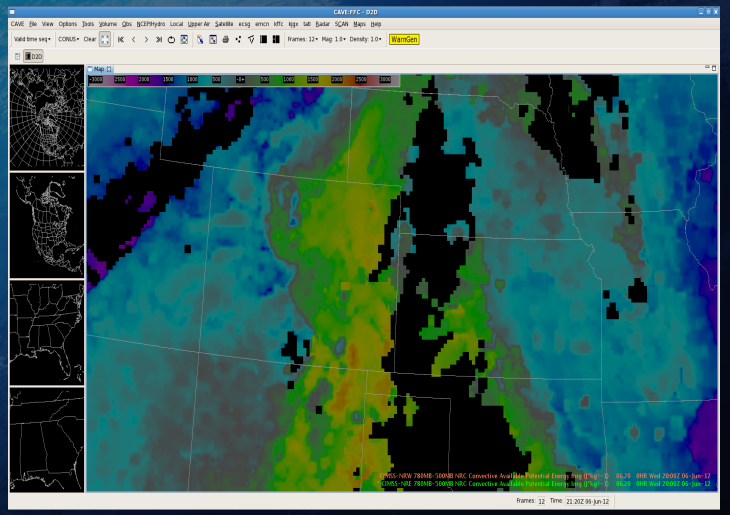
KEGE 291859Z 00000KT 10SM FEW030 M01/M03 A3021 RMK VIS E 3/4 FG BANK E

Introducing NWS Forecasters to Prototype GOES-R Products

- Synthetic GOES-R products ABI products are being demonstrated at NOAA testbeds and GOES-R Proving Ground
- Synthetic GOES-R ABI products help forecaster readiness on day one
- Facilitates user training

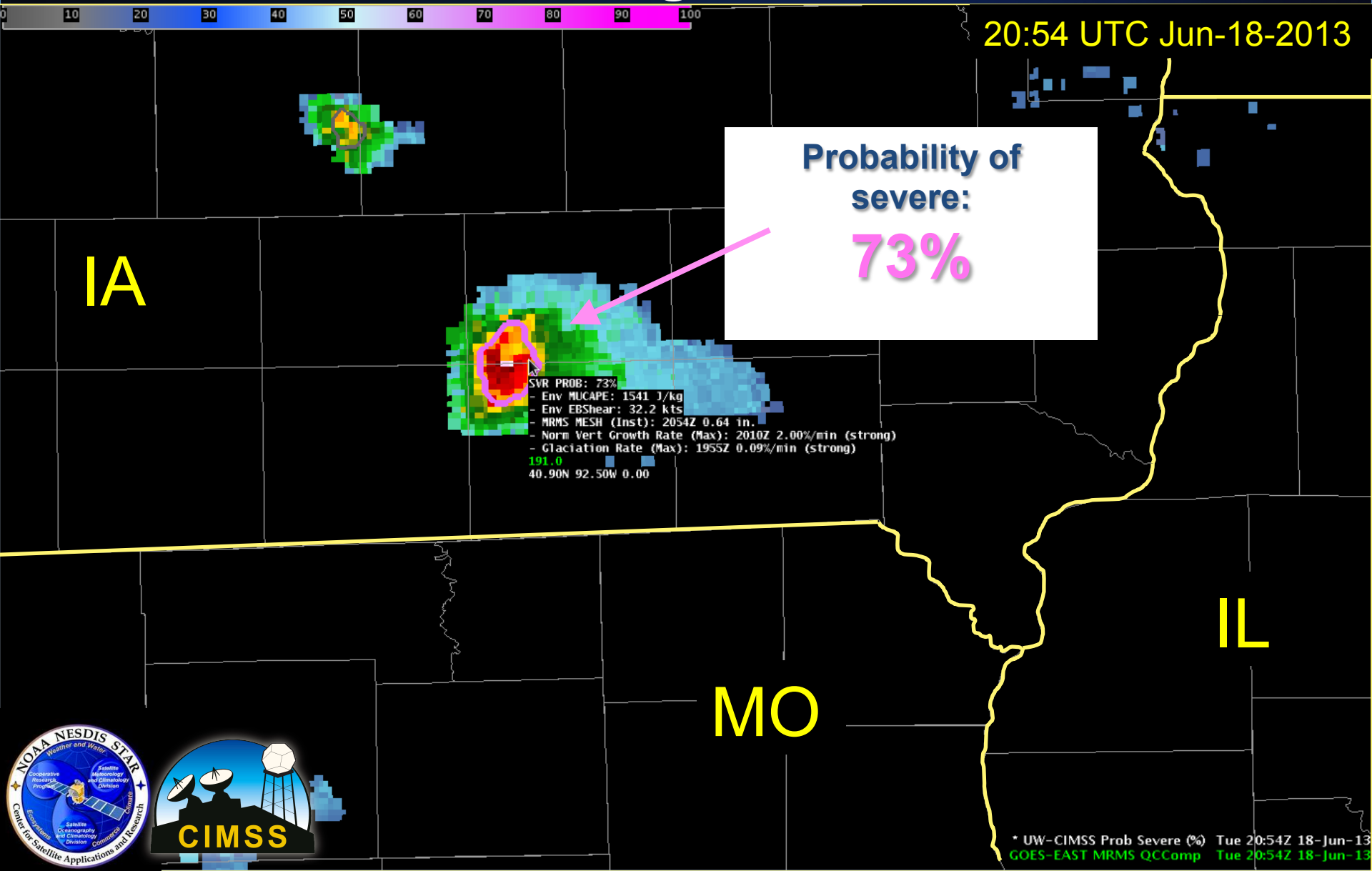


Simulated ABI bands in AWIPS

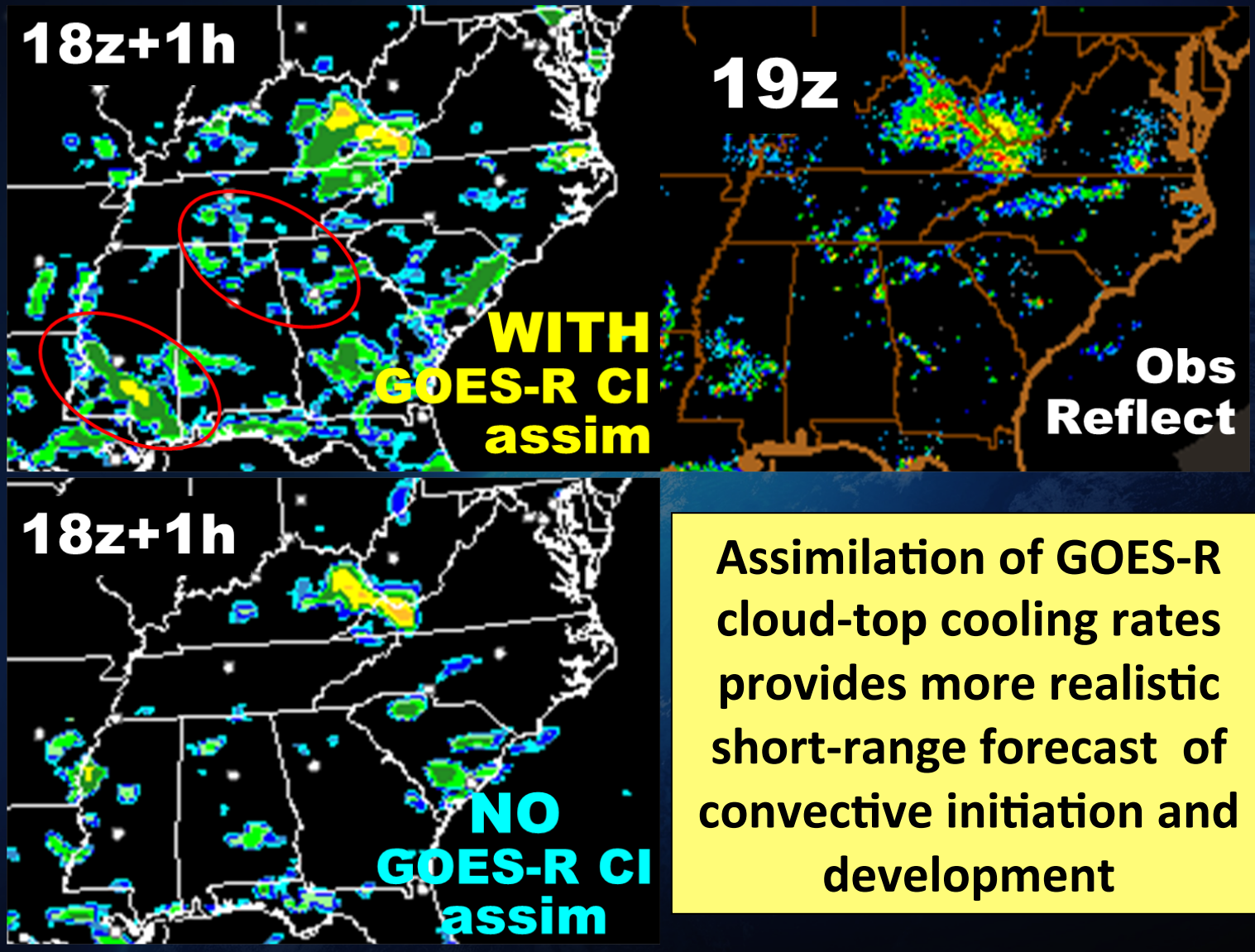


CAPE- an example of Derived Stability Indices indicates a strong instability axis extending into the high plains east of the Rockies.

Probabilistic Forecast of Severe Storms through Data Fusion



Use of GOES–R Data to Improve Convective Initiation Forecasting

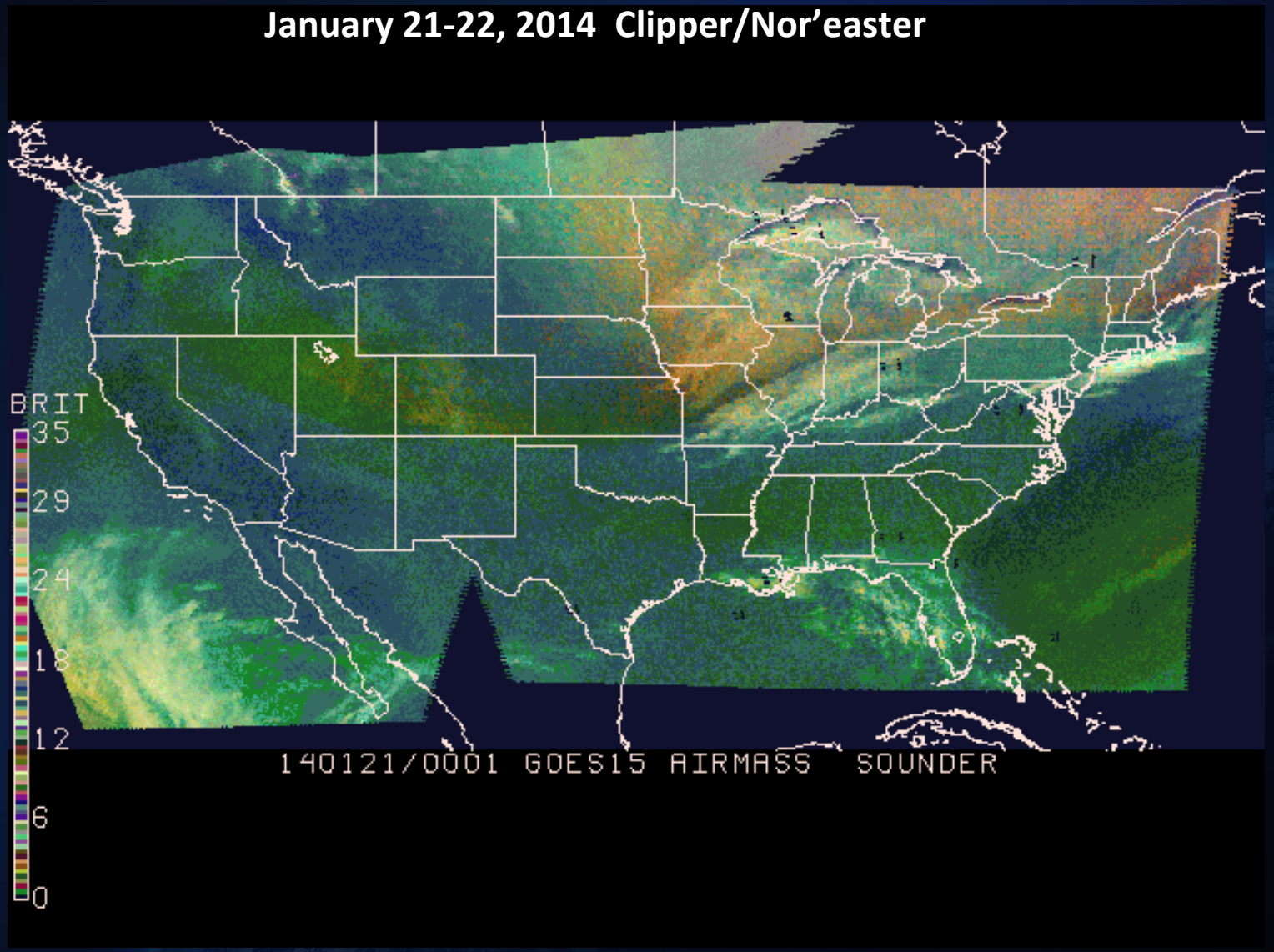


Assimilation of GOES-R cloud-top cooling rates provides more realistic short-range forecast of convective initiation and development

Courtesy of John Mecikalski, UAH

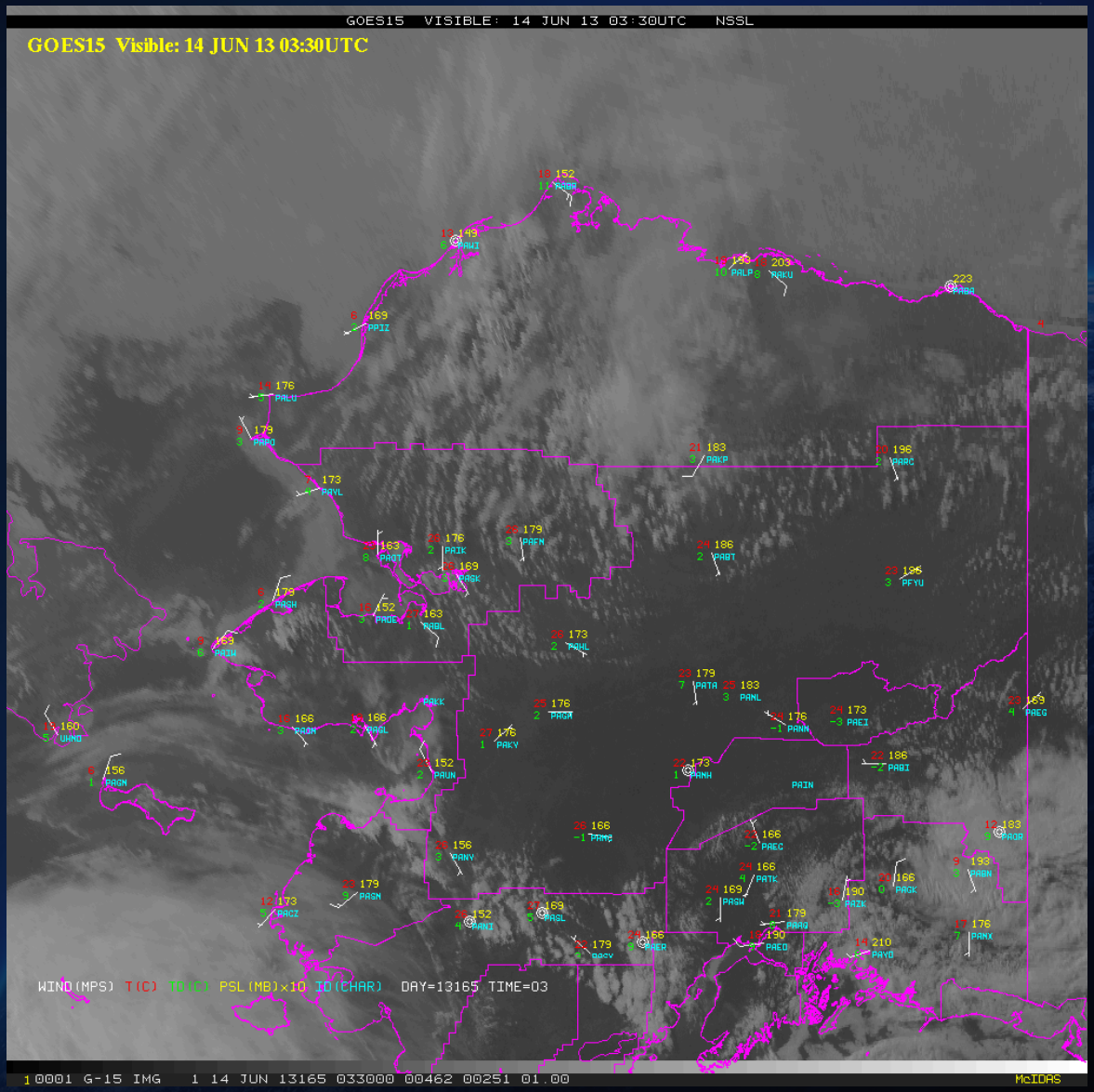
RGB Airmass

January 21-22, 2014 Clipper/Nor'easter



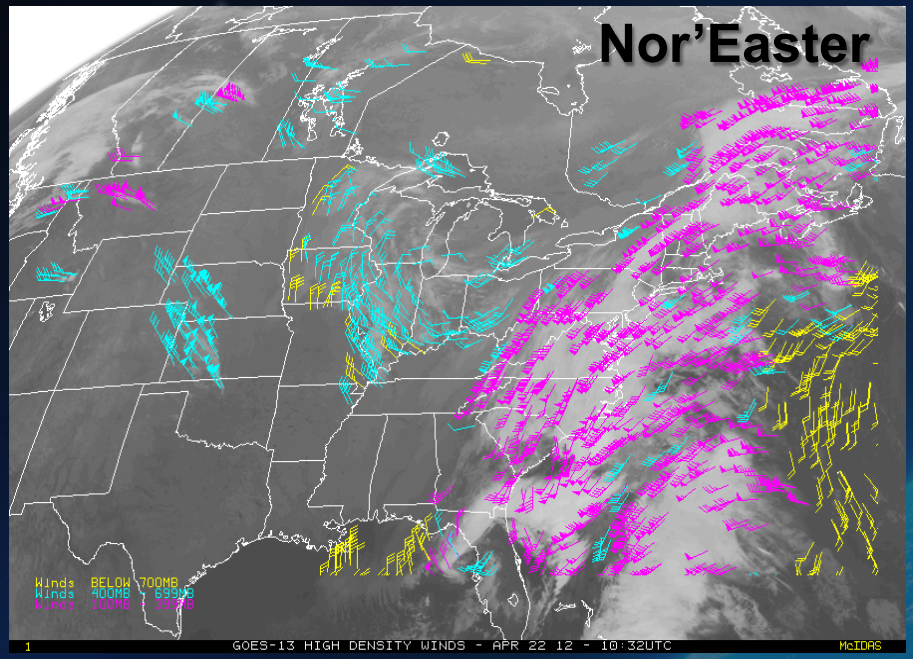
Courtesy of Michael Folmer, (UMCP/ESSIC/CICS)

High Latitude Imagery:
North Slope of Alaska and Arctic Ocean



Courtesy of Robert Rabin, NOAA/NSSL

GOES-13 Winds Using GOES-R Clear-Sky Mask, Cloud and Derived Motion Winds (DMW) Algorithms

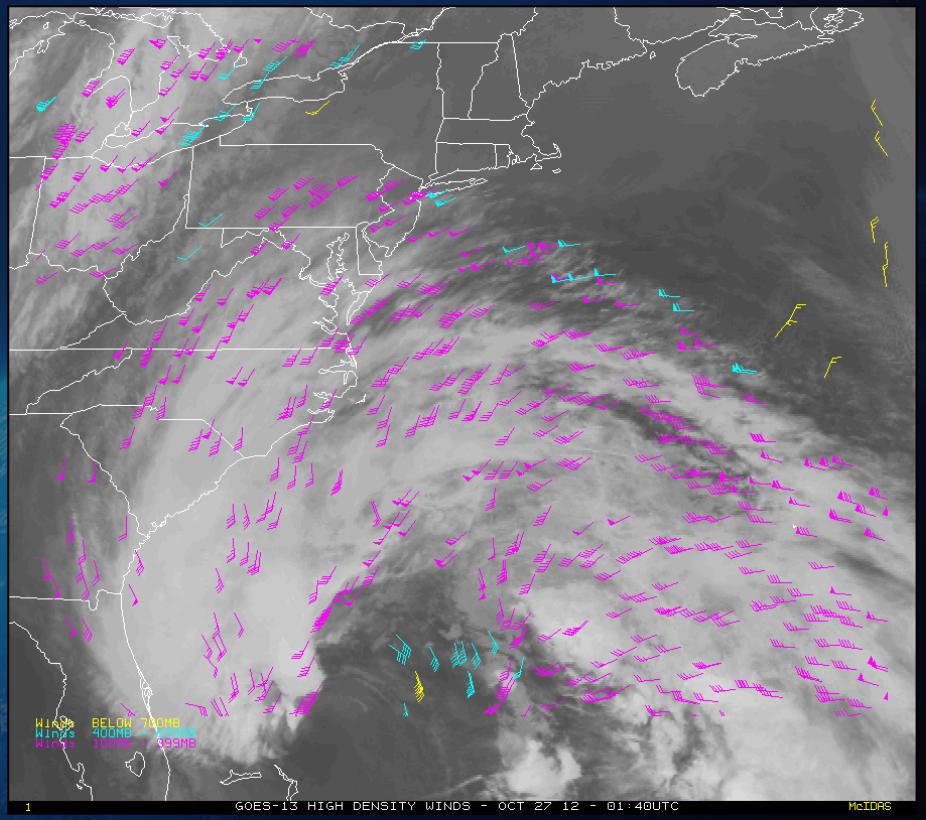


High-Level 100-400 mb Mid-Level 400-700 mb Low-Level >700 mb

Cloud-drift winds derived from 15-min GOES-13 11um imagery 1000 UTC 22 April 2012 – 0800 UTC 23 April 2012

Significance: Early demonstration of GOES-R algorithms using current operational GOES imagers. Plans and work in place to replace existing operational GOES cloud and DMW algorithms with GOES-R algorithms.

Hurricane Sandy



High-Level 100-400 mb Mid-Level 400-700 mb Low-Level >700 mb

Cloud-drift winds derived from 15-minute GOES-13 LWIR (11um) imagery over Hurricane Sandy (4-day loop)

Courtesy of Chris Velden, CIMSS

GOES-14 SRSOR 1-min Super Rapid Scan Experiment

GOES-R Demonstrations at NOAA Testbeds and Proving Grounds
(http://cimss.ssec.wisc.edu/goes/srsor2014/GOES-14_SRSOR.html)

- Dates:
  - May 8-22, 2014
  - August 14-28, 2014
- Target Locations:
  - Norman, OK- NEXRAD, MPAR, OKLMA (primary site)
  - Huntsville, AL- NEXRAD, UAH dual-pol radars, NALMA
  - Sterling, VA- NEXRAD, TDWR, DCLMA
  - Fort Collins, Colorado- NEXRAD, CSU-CHILL, NCLMA
  - Melbourne/KSC, FL- NEXRAD, LDAR II
  - IPHEX/Hydrometeorology Testbed - GPM validation campaign
  - Atlantic Ocean/GulfMex Basin- NASA EV-1 Hurricane and Severe Storm Sentinel-HS3 science flights

AMVs in High Impact Weather

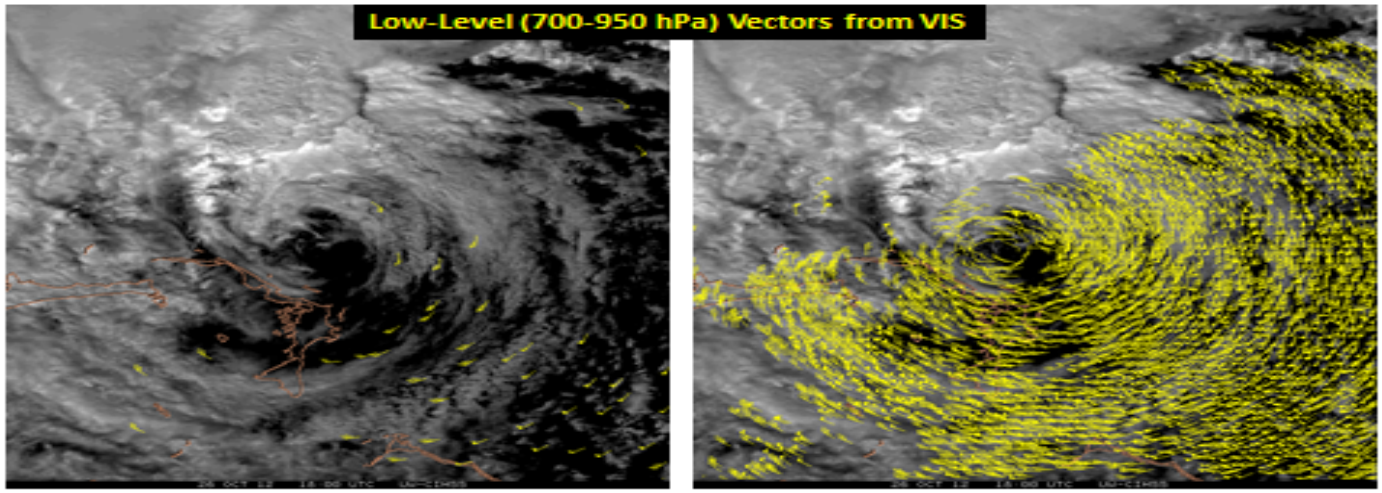
- Adapt the GOES-R AMV tracking algorithm to focus on the smaller (meso) scales for AMV derivation, quality control, and applications and coincident with periods of GOES rapid-scan operations.
- Optimize the algorithm settings, tuning, and AMV derivation path to increase the data density and improve the ultimate quality.
- Run the refined GOES-R AMV algorithm using proxy datasets, such as available from routine GOES RSO/SRSO periods, and from recent special GOES-14 1-min scanning periods (i.e. Hurricane Sandy). Prepare the AMV datasets for trial assimilation into operational regional models.
- Collaborate with national centers of expertise in regional data assimilation and NWP (NCEP-EMC, JCSDA, ESRL) to conduct AMV impact experiments on jointly-selected cases of interest (high-impact weather events, model forecast busts, tropical cyclones, etc.).
- Post-launch real-time demonstrations in Year 3

C. Velden (CIMSS)

AMVs in High Impact Weather

Atmospheric Motion Vectors from GOES-R

Proxy: AMVs from special GOES-14 super-rapid-scan ops during *Hurricane Sandy*



AMVs from 15-min images (routine GOES sampling)

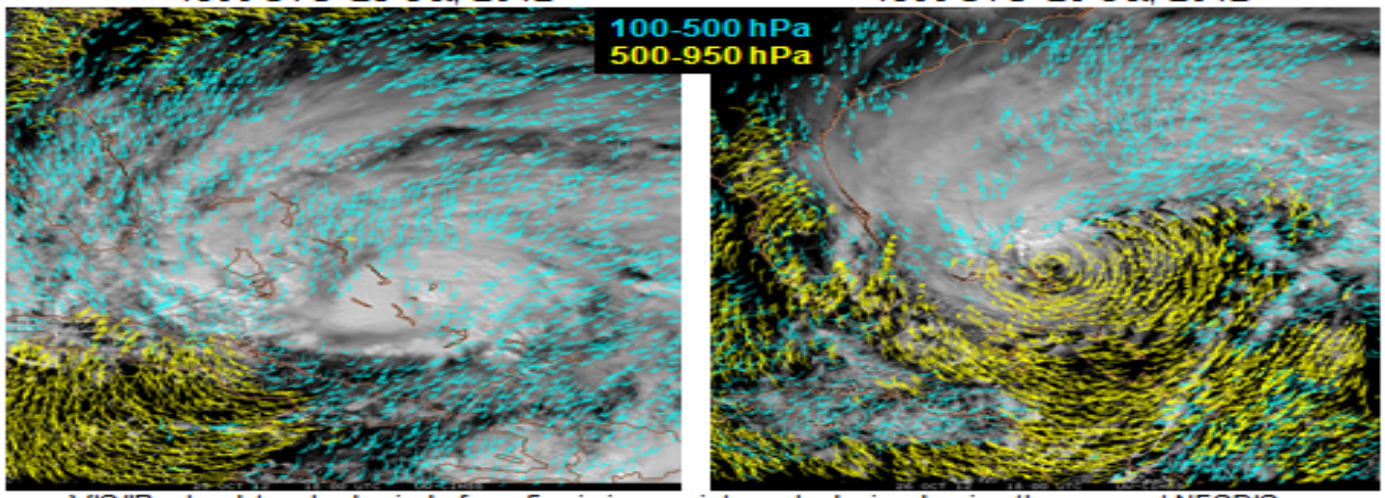
AMVs from 1-min images (meso GOES-R sampling)

1800 UTC 26 Oct, 2012

C. Velden (CIMSS)

1800 UTC 25 Oct, 2012

1800 UTC 26 Oct, 2012

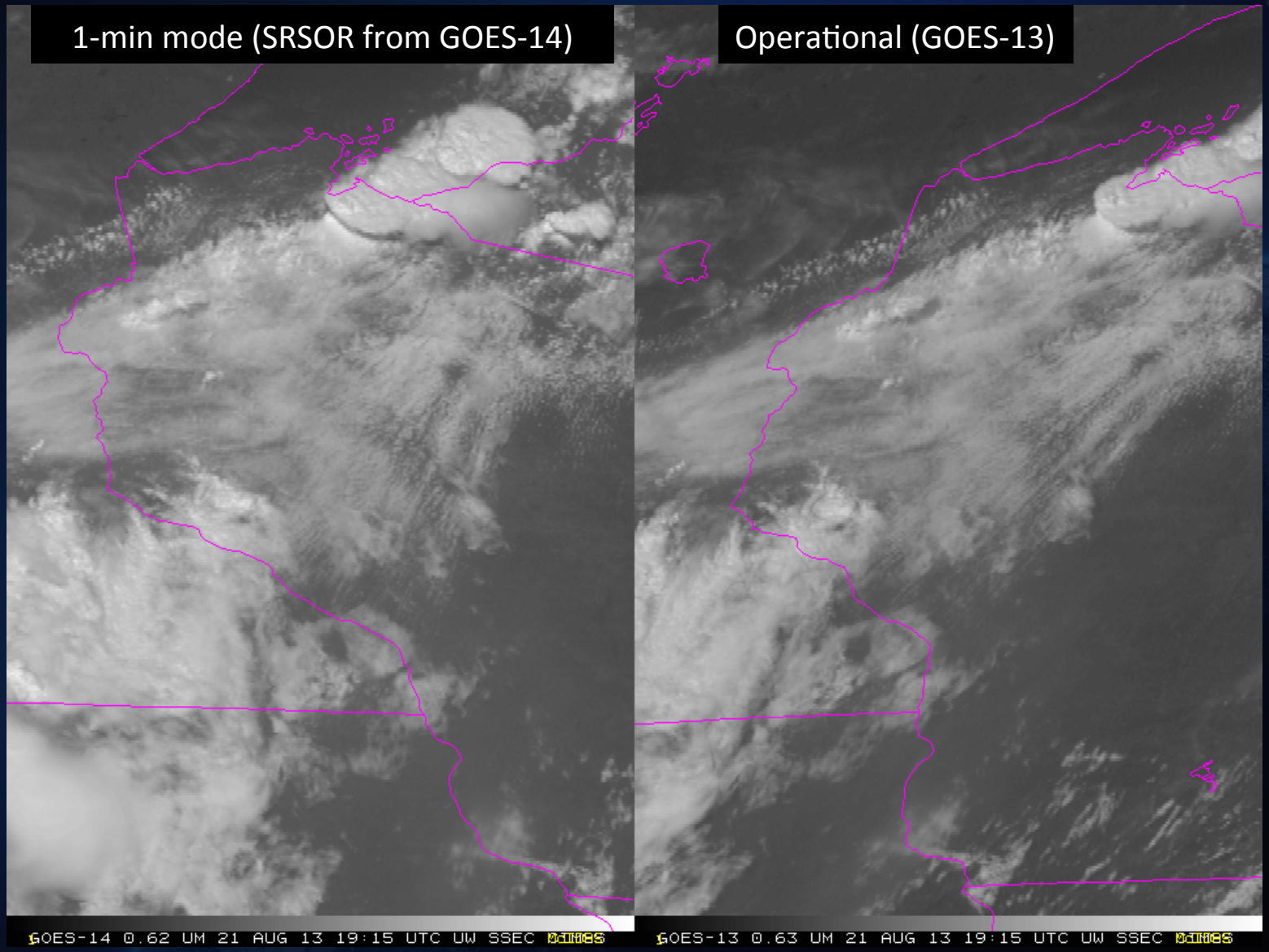


VIS/IR cloud-tracked winds from 5-min image intervals derived using the current NESDIS operational AMV algorithm. Tests using the new GOES-R tracking algorithm are underway. Data assimilation and model forecast impact experiments are planned.

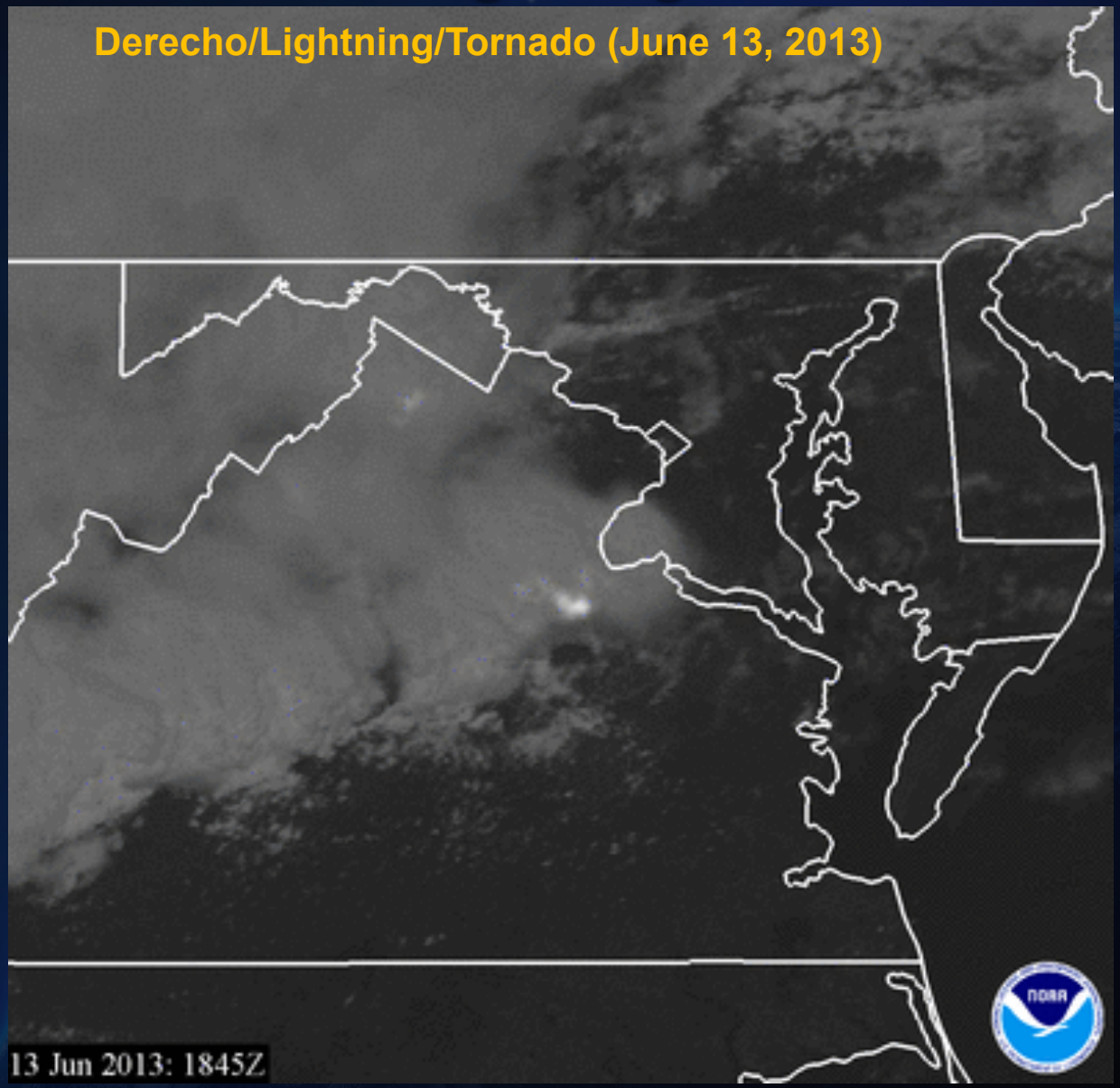
C. Velden (CIMSS)

SRSO-R Imagery of Convection over the Upper Midwest

August 21, 2013

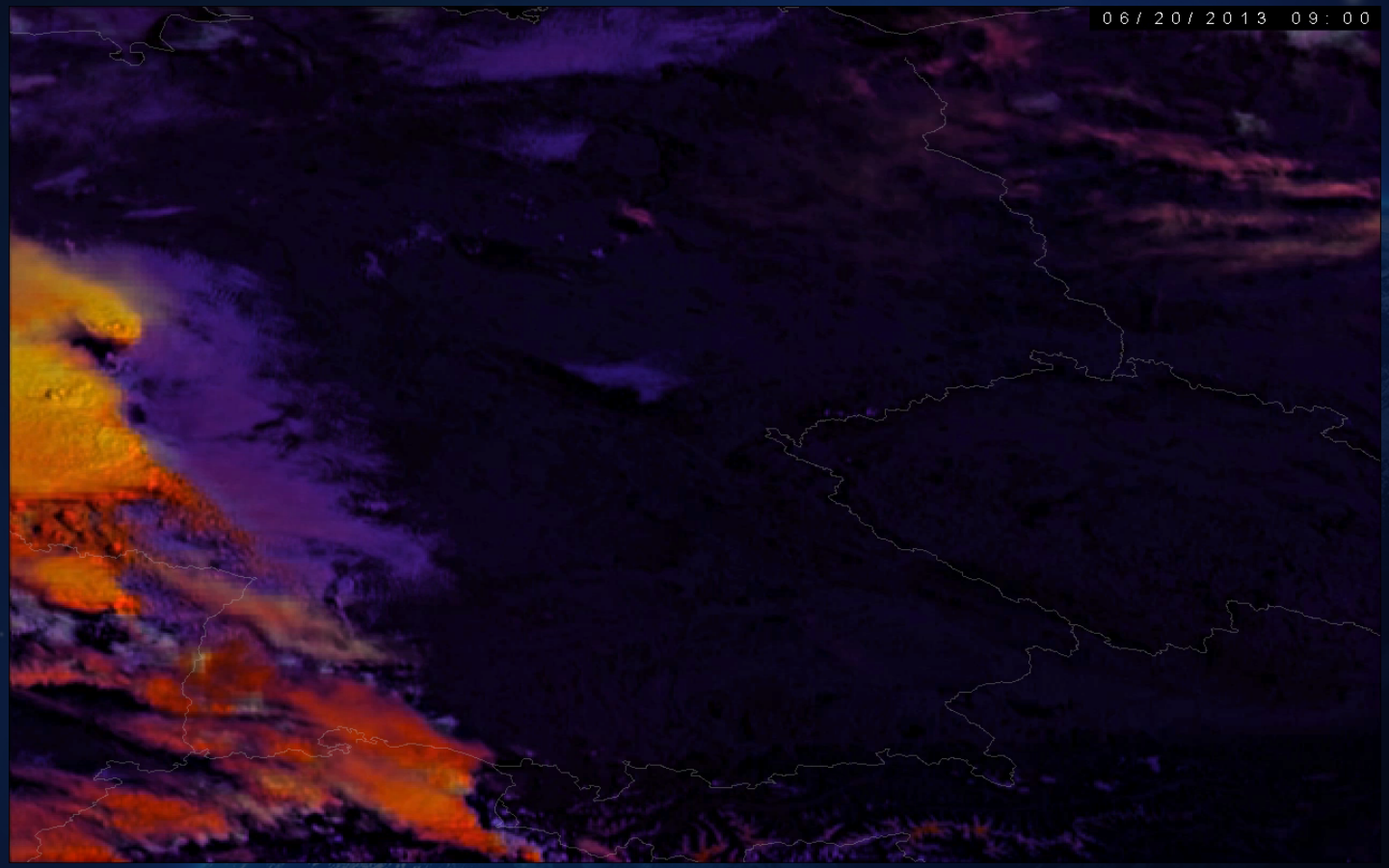


GOES-R Rapid Refresh- 1-min Imagery and Lightning



Courtesy of Scott Rudlosky, CICS-MD

ABI Super Rapid Scan
Moving toward data fusion
(SEVERI Sandwich Product Proxy)



Courtesy of Martin Setvak, CHMI)

Why NWS needs this?

- Situational Awareness
- Warning confidence
- Decision Support (venues)

GOES-R Series
Improved Space Weather Capabilities

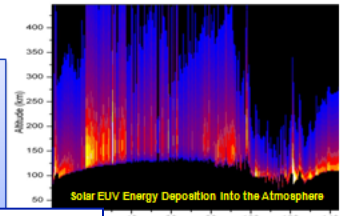
The GOES-R series space/solar sensors provide incremental improvements to current NOAA GEO space weather monitoring

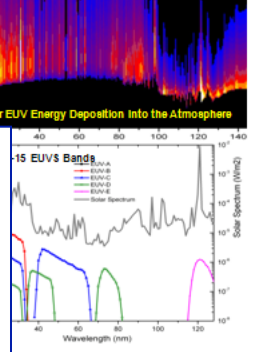
Solar X-Ray Sensor (XRS)

- Measures the irradiance (total brightness) of the sun in two x-ray channels
  - 0.05 to 0.4 nm
  - 0.1 to 0.8 nm
- Provides a first alert of impending solar storms and space weather events.
- Observes solar flares and provides absolute brightness information.
- Drives space weather scales and operational models.

Solar Extreme Ultra-Violet Sensor (EUVS)

- Observations of the Solar EUV Spectrum from 5 to 125 nm
- Provides solar EUV input to thermosphere and ionosphere models which provide specification and forecasts
- Models provide specification and





Increased # of wavelength bands

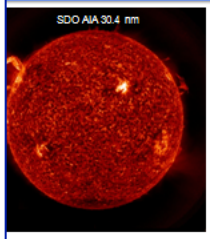
Solar Ultra-Violet Imager (SUVI)

Completely Different than GOES NOP:
- GOES NOP SXI observes in x-rays (0.6-6 nm)
- SUVI will observe in the Extreme Ultra-Violet (EUV) (10-30 nm)

Narrow band EUV Imaging: Permits better discrimination between features of different temperatures
- 30.4 nm band adds capability to detect filaments and their eruptions
- 6 wavelengths (9.4, 13.1, 17.1, 19.5, 28.4, and 30.4 nm) 2 minute refresh for full dynamic range

SUVI will provide
- Flare location information (Forecasting event arrival time and geo-effectiveness)
- Active region complexity (Flare forecasting)
- Coronal hole specification (High speed solar wind forecasting)

provides Improved proxy data:
many pixels as SUVI
cadence
in 8 EUV bands, 6 of which match SUVI exactly



Solar UV imagery versus soft x-rays

Space Environment In-situ Sensor Suite SEISS

Four Subsystems
Measuring Electrons, Protons, and Heavier Particles

MPS-Low: Spacecraft charging, ground-induced currents (electric power grid)
- 30ev-30keV electrons
- 30ev-30keV protons
- 14 angular bins

MPS-High: Spacecraft charging, deep dielectric charging
- 40keV-4MeV electrons
- 80keV-10MeV protons
- 10 energy bands at 5 angles

SGPS: Solar Energetic Particle events (SEP), solar radiation storms (protons), HF communication (airlines), astronaut radiation, satellite degradation.
- 1 MeV-500MeV protons
- 4MeV-500MeV alphas
- 10 energy bands at 2 angles

EHIS: Satellite single event upsets, astronaut radiation
- 10MeV/nucleon-200MeV/nucleon
- Distinguishes H, He, C-N-O, Ne-S and the Fe group, Z=17-28
- 5 energy bands

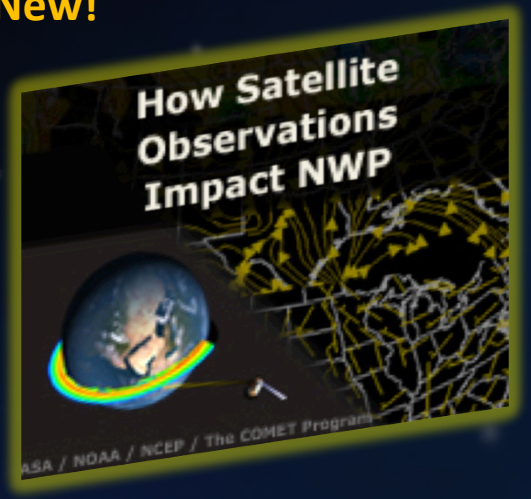
SEISS Algorithms
- **SEISS.16**: One-minute averages - all MPS channels
- **SEISS.17**: Five-minute averages - all MPS and SGPS channels
- **SEISS.18**: Convert differential proton flux values to integral flux values
- **SEISS.19**: Density & temperature moments & level of spacecraft charging
- **SEISS.20**: Event detection based on flux values

Improved particle energy coverage

Not shown: GOES-R Magnetometer

Training and User Education Materials

New!



Online Training Modules

- How Satellite Observations Impact NWP
- GOES-R ABI: Next Generation Satellite Imaging (COMET)
- GOES-R: Benefits of Next-Generation Environmental Monitoring (COMET)
- Satellite Hydrology and Meteorology for Forecasters (SHyMet)
- SPoRT product training modules
- VISIT Training Resources
- Commerce Learning Center

New!

Printed Materials

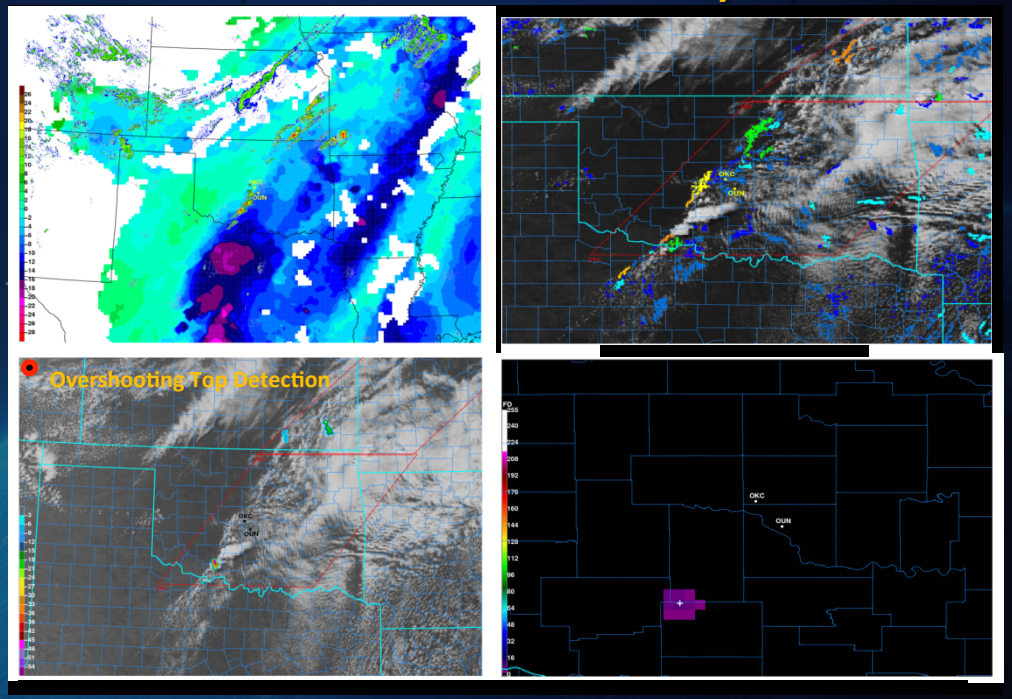
- GOES-R Fact Sheets (18)
- User Readiness Plan
- GRB Downlink Specifications and Product Users Guide
- Proving Ground Demonstration Final Reports and Annual Reports

New!

GOES-R Science Seminars

- Promote more frequent communication with the user community about GOES-R science and demonstration activities
  - Semi-monthly virtual science seminars
  - Allow scientists to highlight their work to the rest of the community
  - http://www.goes-r.gov/users/sci-sem/index.html

GOES-R Convective Situational Awareness Display
Moore, OK Tornado Outbreak May 20, 2013



From January 24, 2014 Science Seminar on Severe Weather. These products provide enhanced situational awareness of the convective environment. Courtesy of Chad Gravelle, CIMSS

Additional User Engagement

- **NOAA Satellite Conference** (Location TBD, DC area, April 20-24, 2015)
- **Satellite Proving Ground/User Readiness Meeting** (Kansas City, MO, June 2-6, 2014)
- **JCSDA Technical Review and Science Workshop on Satellite Data Assimilation** (College Park, MD, May 21-23, 2014)
- **2014 NOAA Testbeds/Proving Grounds Workshop** (College Park, MD, April 16-18, 2014)
- **Warn on Forecast-High Impact Weather Workshop** (Norman, OK, April 1-3, 2014)
- **NOAA Satellite Science Week** (Virtual Meeting, March 10-14, 2014)
- **94th American Meteorological Society Annual Meeting/10th Annual Symposium on New Generation Operational Environmental Satellite Systems** (Atlanta, GA, February 2-6, 2014)
- **GLM Science Team Meeting** (Huntsville, AL, September 24-26, 2013)
- **EUMETSAT Meteorological Satellite Conference** (Vienna, Austria, September 16-20, 2013)

Just-In-Time Training for Forecasters

- Revive funding to VISIT – Virtual Institute for Satellite Integration Training (CIRA & CIMSS)
- VISIT serves as GOES-R Help Desk function via email/phone queries
- VISIT leads "Storm of the Day" webinars open to all offices – using real-time satellite data discussions or recent case events
- NESDIS, NASA and NWS SMEs contribute

SOO Training Framework

Science Infusion Week

- Science workshop to impact warning forecast process
- graduate level – get people excited about science
- 1 week – class size – 20-25
- GOES-R/Models/Impact Events/Services

Long term post Science Infusion Week Follow-up

- Once a month (1-2 hours)
- Direct participation by SOOs from class --sharing science/cases
- Grad level
- Need long term management of this

Science Friday

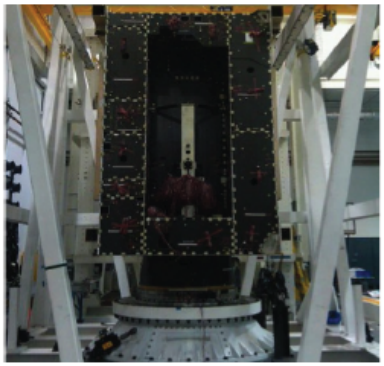
- Once a month – ***get all staff excited about science***
- 1 hour -- focus on new science /technology that field can use
- Led by an expert
- Record /build library for people who miss
- Need a manager to ensure expert presentation is useful
  - SOO panel to help select/manage process

GOES-R Quarterly Newsletter

A Note from Greg Mandt, GOES-R System Program Director
Welcome to the inaugural issue of the GOES-R Quarterly Newsletter. The newsletter will highlight significant news and activities across the program for our stakeholders, industry partners, and the public. I hope you will find this to be a valuable resource in keeping up on the latest happenings with the GOES-R Series Program! The GOES-R Program welcomes your comments and feedback regarding the newsletter. Email us at nesdis.goesr@noaa.gov.

Highlights

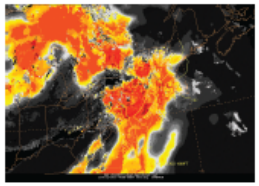
Lockheed Martin delivered the GOES-R core structure to the company's Mississippi Space and Technology Center on NASA's Stennis Space Center where it is undergoing propulsion system integration. The team is integrating GOES-R's fuel tanks, lines, thermal controls and other systems within the core structure. A press release was issued January 7, 2013.



The rigid external structure of the GOES-R satellite, which will enclose the satellite's propulsion system and support the payloads, was designed by Lockheed Martin and manufactured by ATK Aerospace Group's Space and Components Division, in San Diego. Photo credit: ATK

The Product Anomaly, Ticket, Relationship, Organization, and Notification tool (PATRON) became operational on February 1, 2013 at the NOAA Satellite Operations Facility (NSOF) in Suitland, VA to support satellite product operations at the NESDIS Office of Satellite Products and Operations (OSPO). PATRON, developed by the GOES-R Data Operations Support Team (DOST) and Harris Corp, is an early release of the enterprise management system being developed for GOES-R. Originally created specifically for the GOES-R Ground Segment, the tool was soon implemented to support other NOAA environmental satellites in operation today. A press release was issued March 21, 2013.

The first annual Aviation Weather Center Winter Weather Experiment (WWE) was conducted February 11-22, 2013 at the Aviation Weather Testbed in Kansas City, MO. The experiment was part of GOES-R Proving Ground activities and provided a pre-operational environment in which to test and evaluate new GOES-R products



The GOES-R Fog and Low Status product demonstrated February 11, 2013 at the Aviation Weather Center as part of the 2013 Winter Weather Experiment.

To subscribe: nesdis.goesr@noaa.gov

A Note from Greg Mandt, GOES-R System Program Director
We had another successful quarter for the GOES-R Series Program, with the achievement of several critical milestones as you'll read below. Looking forward, we are nearing completion of the remaining instruments while continuing to make steady progress with the spacecraft and development of our ground segment. I thank you for your dedication and commitment to work aggressively to meet our goals. As always, we want to hear from you. If you have questions, feedback or additional ideas, email us at nesdis.goesr@noaa.gov.

Highlights

GOES-R's primary instrument, the Advanced Baseline Imager (ABI), successfully completed the Protoflight Model (PFM) Pre-Shipment Review (PSR) on September 26. The three day review culminated with concurrence from the Integrated Independent Review Team that the ABI PFM can proceed toward shipment. In early 2014, the ABI PFM will be shipped from its developer, Exelis, to the spacecraft developer, Lockheed Martin Space Systems Co. (LMSSC), to be installed onto the first GOES-R spacecraft. NOAA issued a press release on October 31 to announce the milestone. In addition, a new video and fact sheet featuring ABI were released, highlighting the many improvements that the instrument will bring to weather forecasting and issuing warnings. NASA issued a web feature and created a Flickr gallery of ABI images in support of the accomplishment.

Engineers at Exelis prepare the completed ABI PFM for transport to its Rochester facility where it will be stored until shipment to LMSSC for integration onto the GOES-R spacecraft. Credit: Exelis

did you know? ...that the GOES-R Ground Segment will process approximately 40 times more data than is possible today?

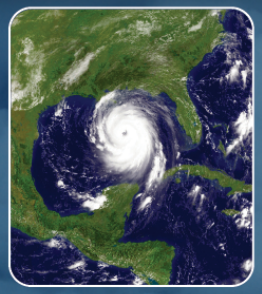
Summary

- GOES-R Products Provide a Quantum Leap in Forecaster Capabilities
- GOES-R Proving Ground provides mechanism to:
  - Involve CIs, AWG, National Centers, NOAA Testbeds and WFOs in user readiness
  - Get prototype GOES-R products in hands of forecasters and showcase their capabilities
  - Keep lines of communication open between developers and forecasters
  - Allow end user to have say in final product, how it is displayed and integrated into operations
- With the Proving Ground, forecasters will be able to use the improved GOES-R products on Day 1!

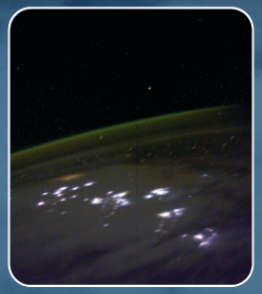
GOES-R

Geostationary Operational Environmental Satellite - R Series

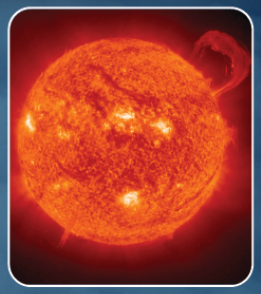
The next-generation of geostationary environmental satellites



Advanced imaging for accurate forecasts



Real-time mapping of lightning activity



Improved monitoring of solar activity

Spacecraft image courtesy of Lockheed Martin

Thank you!

For more information visit www.goes-r.gov

CONNECT WITH US